

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 37

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOUICHI MISHIO, SATOSHI TAKAHASHI and SHIGERU KOMATSU

Appeal No. 96-3997
Application No. 08/173,953¹

ON BRIEF

Before THOMAS, HAIRSTON and RUGGIERO, Administrative Patent Judges.

RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 5, 6, 8, and 9, all of the claims pending in the present application. Claims 1-4 and 7 have been canceled.

¹ Application for patent filed December 28, 1993. According to the appellants, the application is a continuation of Application No. 07/720,831, filed September 16, 1991, now abandoned.

The claimed invention relates to a breakdown type bipolar diode incorporated in an integrated circuit.

Claim 6 is illustrative of the invention and reads as follows:

6. A bipolar diode comprising:

an epitaxial layer of a first conductivity type formed on a semiconductor substrate of a second conductivity type;

an impurity region of the first conductivity type formed in a surface portion of the epitaxial layer;

a first impurity region of the second conductivity type formed in the surface portion of the epitaxial layer in a manner to contact with the impurity region of the first conductivity type;

a second impurity region of the second conductivity type formed in contact with the impurity region of the first conductivity type and the first impurity region; and

an insulating layer formed over the surface of the epitaxial layer to protect a junction end of the associated regions;

wherein said second impurity region is formed in a region shallower than a buried layer of the first conductivity type formed between the epitaxial layer and the semiconductor substrate, the second impurity region having a maximal impurity concentration at a predetermined distance from the surface of the epitaxial layer toward an inside of the epitaxial layer and being higher in impurity concentration than the first impurity region,
and

wherein a breakdown of a junction of the impurity region of the first conductivity type and the second impurity region is caused at a location shallower than the buried layer.

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The Examiner relies on the following references:

Chruma et al. (Chruma)	4,732,866	Mar. 22,
1988		
Matsubara (Japanese Kokai) ²	56-36171	Apr. 09,
1981		
Watanabe et al.	60-229376	Nov. 14,
1985		
(Japanese Kokai)		

The rejections of the appealed claims are set forth by
the Examiner as follows:

1. Claims 8 and 9 stand finally rejected under 35
U.S.C.

§ 103 as being unpatentable over Japanese Kokai 60-229376
together with Japanese Kokai 56-36171.

2. Claims 5, 6, 8, and 9 stand finally rejected under
35 U.S.C. § 103 as being unpatentable over Japanese Kokai 60-
229376 together with Japanese Kokai 56-36171 and Chruma.³

² Copies of the translations provided by the U. S. Patent
and Trademark Office, February 1999, of each of the Japanese
Kokai references relied on are included and relied upon for
this decision.

³ Since both Appellants and the Examiner have referred to
the Japanese Kokai documents by the Kokai designation and
number rather than the inventor's name, we will do so also in
this decision to maintain consistency.

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Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Briefs and Answers for the respective details thereof.⁴

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the Examiner and the evidence of obviousness relied upon by the Examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellants' arguments set forth in the Briefs along with the Examiner's rationale in support of the rejections and arguments in rebuttal set forth in the Examiner's Answers. It is our view, after consideration of the record before us, that the collective evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the

⁴ The (revised) Appeal Brief was filed December 1, 1995. In response to the Examiner's Answer dated February 15, 1996, a Reply Brief was filed April 10, 1996. The Examiner entered the Reply Brief and submitted a supplemental Examiner's Answer in response dated May 30, 1996.

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art the obviousness of the invention as set forth in claims 5,
6, 8, and 9. Accordingly, we reverse.

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In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825

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(1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.,
776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

We note that each of the independent claims 6, 8, and 9 recites the construction of a bipolar diode in which a subsurface breakdown region is implanted below the surface of an epitaxial layer. The relevant portion of independent claim 6 (similar recitations of which appear in independent claims 8 and 9) recites:

wherein said second impurity region is
formed in a region shallower than a buried
layer of the first conductivity type formed

between the epitaxial layer and the semiconductor substrate, the second impurity region having a maximal impurity concentration at a predetermined distance from the surface of the epitaxial layer toward an inside of the epitaxial layer and being higher in impurity concentration than the first impurity region.

The Examiner, in making the obviousness rejection (Answer, pages 4 and 7), seeks to modify the breakdown diode of Kokai 60-229376 by substituting the buried implanted subsurface breakdown region taught in the breakdown diode of Kokai 56-36171 (element 5, Figure 2) for the diffused breakdown region 5 in Kokai 60-229376.

In response, Appellants assert a lack of suggestion or motivation in the references for combining or modifying teachings to establish a prima facie case of obviousness. After careful review of the Kokai 60-239376 and Kokai 56-36171 references, we are in agreement with Appellants' stated position in the Briefs. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F. 2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). The Examiner's statement of the grounds of rejection at page 4 of

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the Answer, is lacking in any rationale as to why the skilled artisan would modify Kokai 60-239376 in such a manner. Rather than pointing to specific information in Kokai 56-36171 that would suggest the combination with Kokai 60-239376, the Examiner instead has described the similarities between the Kokai references and the claimed invention. Nowhere does the Examiner identify any suggestion, teaching, or motivation to combine the Kokai references nor does the Examiner establish any findings as to the level of ordinary skill in the art, the nature of the problem to be solved, or any other factual findings that would support a proper obviousness analysis. See, e.g., Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F. 3d 1568, 37 USPQ2d 1626 (Fed. Cir. 1996). We are left to speculate why one of ordinary skill would have found it obvious to substitute a buried implanted subsurface breakdown region for the diffused breakdown region in Kokai 60-239376. The only reason we can discern is improper hindsight reconstruction of Appellants' claimed invention. In order for us to sustain the Examiner's rejection under 35 U.S.C. § 103, we would need to resort to speculation or unfounded assumptions or rationales to supply deficiencies in the

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factual basis of the rejection before us. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968), rehearing denied, 390 U.S. 1000 (1968). Since we are of the view that the prior art applied by the Examiner does not support the rejection, we do not sustain the rejection of independent claims 6, 8, and 9.

With respect to dependent claim 5, the Examiner adds Chruma to the combination of Kokai 60-239376 and Kokai 56-36171 solely to meet the "silicon nitride" insulating layer limitation. Chruma, however, does not overcome the innate deficiencies of the combination of the Kokai references and, therefore, we do not sustain the rejection of claim 5 under 35 U.S.C. § 103.

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In view of the foregoing, the decision of the Examiner
rejecting claims 5, 6, 8, and 9 under 35 U.S.C. § 103 is
reversed.

REVERSED

JAMES D. THOMAS)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
KENNETH W. HAIRSTON)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
JOSEPH F. RUGGIERO)	
Administrative Patent Judge)	

jrg

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JENINE GILLIS

*ATTN: A copy of both Japanese
Kokai references are in the
envelope--ready to be mailed.*

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Judge RUGGIERO

Judge HAIRSTON

Judge THOMAS

Received: 5/4/99

Typed: 5/5/99

DECISION: REVERSED

Send Reference(s): Yes No
or Translation(s)

Panel Change: Yes No

3-Person Conf. Yes No

Remanded: Yes No

Brief or Heard

Group Art Unit: 2815

Index Sheet-2901 Rejection(s): _____

Acts 2: _____

Palm: _____

Mailed: Updated Monthly Disk (FOIA): _____

Updated Monthly Report: _____

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